

A REEXAMINATION OF THE ORIGIN OF FOREST DIFFERENCES AT A SUBALPINE LOCATION IN COLORADO

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ABSTRACT

Baker (1991) proposed that forest differences observed on either side of a fence were attributable to differences in grazing. The study location is in a subalpine forest on the Pike National Forest adjacent to the fenced boundary of Colorado Springs watershed land. Grazing on the watershed land has been excluded for over a century, and U.S. Forest Service land has had moderate grazing over the same time period. The Forest Service land supports a relatively dense forest comprised primarily of *Pinus aristata*. The watershed land has a less dense cover composed primarily of *Picea engelmannii*. Baker (1991) attributed vegetation differences to differential grazing pressure. Additional information suggests an alternate explanation for the vegetation characteristics of this site. In the 1930's, the Forest Service began a program of monitoring areas where trees had been planted or where forest health was a concern. Included in these photographic records is a 1960 photograph of the study area that documents the differences in forest type and cover are related to tree planting activities on the Forest Service side of the fence. The evidence that these trees are planted is based on the linear pattern of trees and a general map that shows where tree planting was done.

Key Words: Colorado Rocky Mountains, grazing, Pikes Peak, repeat photography, subalpine forests, tree planting.

Baker (1991) published an analysis of a subalpine environment on the southern slope of Pikes Peak, Colorado (Range 68 W, Township 15 S, Section 5). He was interested in differences in forest composition related to the different land uses on either side of a fence (Fig. 1). Erected at the beginning of the twentieth century, the fence separates U.S. Forest Service land from Colorado Springs watershed land. The area on both sides of the fence had been affected by a wildfire in the late 1860's and land on the Forest Service side of the fence had been used for cattle grazing. Cattle had been excluded from the adjacent watershed land for more than a century. *Pinus aristata* Engelm. (bristlecone pine) is the most common tree on the Forest Service land while *Picea engelmannii* (Parry) Engelm. (Engelmann spruce) is the dominant tree on the watershed side. Using tree rings Baker (1991) was able to determine that the *P. engelmannii* had established between 1886 and 1921 while the *P. aristata* stands were younger with establishment dates between 1934 and 1952. Baker (1991) concluded that the distinct differences between the two sides of the fence are the result of the differential grazing uses. He hypothesized that grazing on the Forest Service side of the fence had led to drier conditions because of reduced plant cover that favored *P. aristata* over *P. engelmannii*.

Forest Service records indicate that there is another reason for this asymmetric tree distribu-

tion. Following the establishment of the U.S. Forest Service in 1905, large portions of the Pike National Forest were reforested through plantings. Stahelin (1941) reported that between 1906 and 1941 approximately 32,000 acres in Pike National Forest were planted with trees grown at the nearby Monument Nursery. To monitor the health of these trees, the Forest Service established a repeat photography program in the 1930's. The goal of the program was to do repeat photography on a decadal basis. The program was abandoned in the 1960's, and the records were stored by the Forest Service at the Pikes Peak Ranger District Office in Colorado Springs. One of these photographic sites is located near Baker's (1991) site. Although the photographic site was positioned southwest of Baker's site, Forest Service employee J.D. Grover, found the tree pattern along the fence to be of enough interest to photograph it 1960 (Fig. 2). There is no written documentation associated with the photograph that definitively described this location as being planted, but the linear tree pattern strongly suggests that trees on the Forest Service side of the fence were planted. Other well documented photographs of planted trees elsewhere on Pikes Peak show this same type of pattern, so it is reasonable to attribute the tree pattern to human intervention (Jennings 2003).

This photographic evidence appears to refute Baker's (1991) conclusion that grazing was the



FIG. 1. The study site in the fall 2007. U.S. Forest Service land is on the left of the fence which is on the edge of the dense *Pinus aristata* trees behind the campsite. The Colorado Springs watershed land is on the right side and is characterized by *Picea engelmannii*.

cause of the differences across the fence. It appears more likely that tree planting has had a much greater impact on the plant distribution than grazing. The ages of the *P. aristata* trees corresponds with the time of planting and the high density of trees is commensurate with planting densities of that time (Jennings 2003). The differences that Baker (1991) attributes to grazing can also be attributed to tree planting. In some areas of the Western United States it is important to investigate the tree planting history of the area in order to understand the forest dynamics for that area (Show 1924; Flora 2003; Carnus et al. 2006). In many cases the documentation is not readily available. It is apparent that while Baker (1991) was diligent in examining Forest Service records, he never located the photographs. Only their recent discovery by a Forest Service employee provides a better understanding of the Pikes Peak planting history. The author gained access to the photographic record only after asking the Forest Service about planting documents a year or two earlier. These documents turned out to be valuable sources of

information about the forest history of the Pike National Forest. Lacking documentation, it would be prudent for a researcher to examine a study site with the intent of determining if there are indications that the trees at the site had been previously planted. Characteristics of planted forests in the Pike National Forest include trees organized in linear patterns, densely planted trees, and single species stands. The logistics of tree planting would suggest that these characteristics would be found in other regions of the United States. For example, Stahelin (1941) documents that plantations of varying sizes are located throughout Colorado. Researchers would be prudent to keep in mind the likelihood of historical reforestation activities when studying forest stands in Colorado.

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FIG. 2. The same site as Fig. 1 taken in 1960. The linear pattern indicates that the trees on the left side of the photograph were planted.

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